

MULTIMEDIA



UNIVERSITY

STUDENT ID NO

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MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 2, 2018 / 2019

PCO0165 – INTRODUCTION TO COMPUTER ARCHITECTURE AND OPERATING SYSTEM (Foundation in Information Technology)

7 March 2019
2.30 p.m – 4.30 p.m
(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This question paper consists of 3 pages (excluding the cover page) with 5 questions only.
2. Answer **ALL** questions. All questions carry equal marks and the distribution of the marks for each question is given.
3. Please write all your answers in the Answer Booklet provided.

Instructions: Answer **ALL** questions. Write your answers in the Answer Booklet.

QUESTION 1 [10 Marks]

- a. Explain the concept of Von Neumann computer architecture. (3 marks)
- b. Each one of the five generations of computers is characterized by a major technological development that fundamentally changed the way computers operate. Explain the characteristics of the second generation of computers. (3 marks)
- c. A machine cycle consists of the steps that a computer's processor executes whenever it receives a machine language instruction. It is the most basic central processing unit operation, and modern CPUs are able to perform millions of machine cycles per second. Explain the sequences of steps used by the CPU to go through a machine cycle. (4 marks)

QUESTION 2 [10 Marks]

- a. Convert the following decimal notations to their binary equivalents. Show computation steps.
i. 199.50_{10}
ii. 150.25_{10} (3 marks)
- b. Convert the following binary numbers to decimal equivalents. Show computation steps.
i. 11111111.111_2
ii. 1010101011.11_2 (3 marks)
- c. Convert the following hexadecimal notations to their binary equivalents. Show computation steps.
i. $B24E.AD_{16}$
ii. $FC79.58_{16}$ (2 marks)
- d. Convert the following octal notations to decimal equivalents. Show computation steps.
i. 4356_8
ii. 0.65_8 (2 marks)

QUESTION 3 [10 Marks]

- a. Calculate the addition arithmetic operation of the following unsigned binary numbers. Show computation steps.
i. $1011001 + 111010$
ii. $1111111 + 111111$ (3 marks)

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- b. Calculate the subtraction arithmetic operation of the following unsigned binary numbers. Show computation steps.
- i. $10001001 - 1111111$
 - ii. $11100101 - 00101110$
- (3 marks)
- c. Solve the following addition operations using the two's complement addition in 5-bit for signed integer. Show computation steps.
- i. $(-12) + (15)$
 - ii. $14 + (-11)$
- (4 marks)

QUESTION 4 [10 Marks]

- a. There are five addressing modes used in the 8085 microprocessor. Describe the following addressing modes. Give an example for each of the addressing mode.
- i. Implied addressing
 - ii. Immediate addressing
- (2 marks)
- b. Explain the meaning of the following assembly language instructions code.
- i. STA 4000H
 - ii. MVI M, 30H
 - iii. LXI H, 4000H
 - iv. MOV A,M
- (4 marks)
- c. If a programmer is using a high-level language, such as C++ or Java, not much of the architecture of the underlying machine is visible. One boundary where the computer designer and the computer programmer can view the same machine is the machine instruction set. Explain the design principles in machine instruction set from the designer's and the user's point of view.
- (4 marks)

QUESTION 5 [10 Marks]

- a. Define the operating system and list **TWO (2)** widely used operating systems for personal computers.
- (2 marks)
- b. In operating system, a process is a program in execution. As a process executes, it changes state. The state of a process is defined as the current activity of the process. List and briefly describe **THREE (3)** of the states that a process can have at a time in process management.
- (3 marks)
- c. What is a utility program?
- (2 marks)

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- d. One of the major concerns while creating file systems is in what way the sharable files can be protected. Discuss the **TWO (2)** common implementations ways of file protection. (3 marks)